

**SOME OBSERVATIONS ON LARGE BLUE *MACULINEA*
VAN ECKE 1915 BUTTERFLIES (LEP.: LYCAENIDAE) IN THE
PYRENEES**

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I HAVE FOUND four types of adult large blue *Maculinea* butterfly in the Pyrenees. The first two did not cause any identification problems:

1. *Maculinea arion arion* L. (Plate H, Fig. 1). Bright blue with well-defined black markings, flying in July/August 1990 and 1993 in the mountainous Prades region of the Eastern Pyrenees (900 to 1500m). The species was common in the area and in 1993 a number of aberrantly-marked butterflies was seen. One particularly interesting male was heavily suffused with dark grey on the top of its wings and had extremely elongated black marks on the underside. Manley & Allcard (1970) illustrate a similar but slightly less extreme aberration from Spain (Plate 31, fig. 2).
2. *M. arion obscura* Christ. Dark blue with a heavy suffusion of grey and poorly defined black markings flying in July 1991 in similar habitat to *arion arion* (above) in the Benasque Valley (Spanish Central Pyrenees).

However, I have also found two forms (subspecies?) of *M. alcon* that are not easy to classify with respect to each other. They have similar male and female genitalia, but are very different in size, wing shape and wing colour:

3. *M. alcon* subsp? Males small and light blue (Plate H, Fig. 2); females small and heavily diffused with grey (Plate H, Fig. 3); undersides with no blue-green basal flush in either males or females. Flying in July 1990 over mountain meadows at c. 1500m in Andorra and July 1993 in dry mountain meadows in the Eastern Pyrenees at c. 1300m. The latter colony was found on the 22 July in a steep hay-meadow near Prades. The butterflies were fresh and not uncommon. A pack of six males was seen pursuing a newly emerged female with rapid, twisting flight. Cross-leaved gentian *Gentiana cruciata* was present in the flowery meadow, but no *alcon* subsp? eggs were found on the plants. *M. arion arion* and a rich diversity of other butterfly species were also flying in the meadow. When the gentian plants were re-examined on 5 August no *alcon* subsp? adults were flying, but *alcon* subsp? eggs were dotted across the top surfaces of the larger leaves and in the whorl of leaves around the flowers at the top of the plants. These eggs had been laid individually, but there were several per leaf.
4. *M. alcon rebeli* Hirschke. Males (Plate H, Fig. 4) larger than *alcon* subsp? (above) and darker blue with wider black borders; females (Plate H, Fig. 5)

larger than *alcon* subsp? (above) with different shaped wings and deeper blue with more pronounced black markings; undersides with a blue-green basal flush in both males and females. Flying in June/July 1991 and 1994 in dry mountain meadows in the Spanish Central Pyrenees at c. 1000-1500m. *G. cruciata* was present in the meadows.

Although the *alcon* subsp? specimens resemble *alcon alcon* D. & S. as illustrated in Higgins & Riley, 1980 (Plate 18, Figs. 6a & b), I am tentative about classifying them as such because Higgins & Riley (1980) record *alcon alcon* as a lowland species feeding as larvae on *G. pneumonanthe* in marshy places and *alcon rebeli* as the dry meadow species living at higher altitudes (1200-1800m), feeding in the larval stages on *G. cruciata* and *G. germanica*. Manley & Allcard (1970) and van der Poorten (1982) consider *alcon* and *rebeli* to be distinct species, while Hochberg *et al.*, 1992 discuss *rebeli* but do not mention *alcon* in their review of *Maculinea* ecology. The subspecies of *alcon* found at low level in north Spain is recorded as *hospitali* Vilarrubia by Manley & Allcard, 1970 (Plate 30), which L.G. Higgins is recorded as having associated with *alcon* rather than *rebeli*. P.W. Cribb (Cribb, 1970) reported *alcon* in the Spanish Pyrenees, but as it was feeding on *G. cruciata* it could have been *rebeli*.

It is possible that the two types of *alcon* I have found are in fact both forms of *rebeli* as they were living in dry meadows at high levels and apparently feeding as larvae on *G. cruciata*. Higgins (1975) reports a wide range of variation in wing markings between *rebeli* populations.

On 22 July 1993, an aberrant butterfly was found in the steep meadow where *alcon* subsp? were flying (Plate H, Fig. 6). It is a female *Maculinea* which appears to have characteristics of both *arion arion* and *alcon* subsp?. It is intermediate in size between the *arion* and the *alcon* subsp? present in the meadow, although the wing-shape is more reminiscent of *alcon* subsp? than *arion*. The top surface has a dark grey suffusion like female *alcon* subsp?, but also has a blue sheen like *arion*. It has heavily suffused dark grey borders like female *alcon* subsp? and its black spots are much reduced. On the underside it lacks the forewing basal cell spot which is generally present in *arion*, but which is generally (although not exclusively) absent in *alcon* subsp?. The underside ground-colour of the wings is intermediate between the white-cream of *arion* and the sandy-cream of *alcon* subsp?. However, the underside hind-wings have a blue-green basal flush and pronounced black spots like *arion*. Three of the four underside basal spots present on the right hind-wing, are absent from the left hind-wing. All four of these spots are generally present in *arion*, but one or two of them are generally absent in *alcon* subsp?.

The structure of the ovipositor in the aberrant specimen (Fig. 1) is more similar to that of an *arion* from the meadow (Fig. 2), with heart-shaped sides to the ovipositor and a swelling at the ends of the ovipositor's supporting

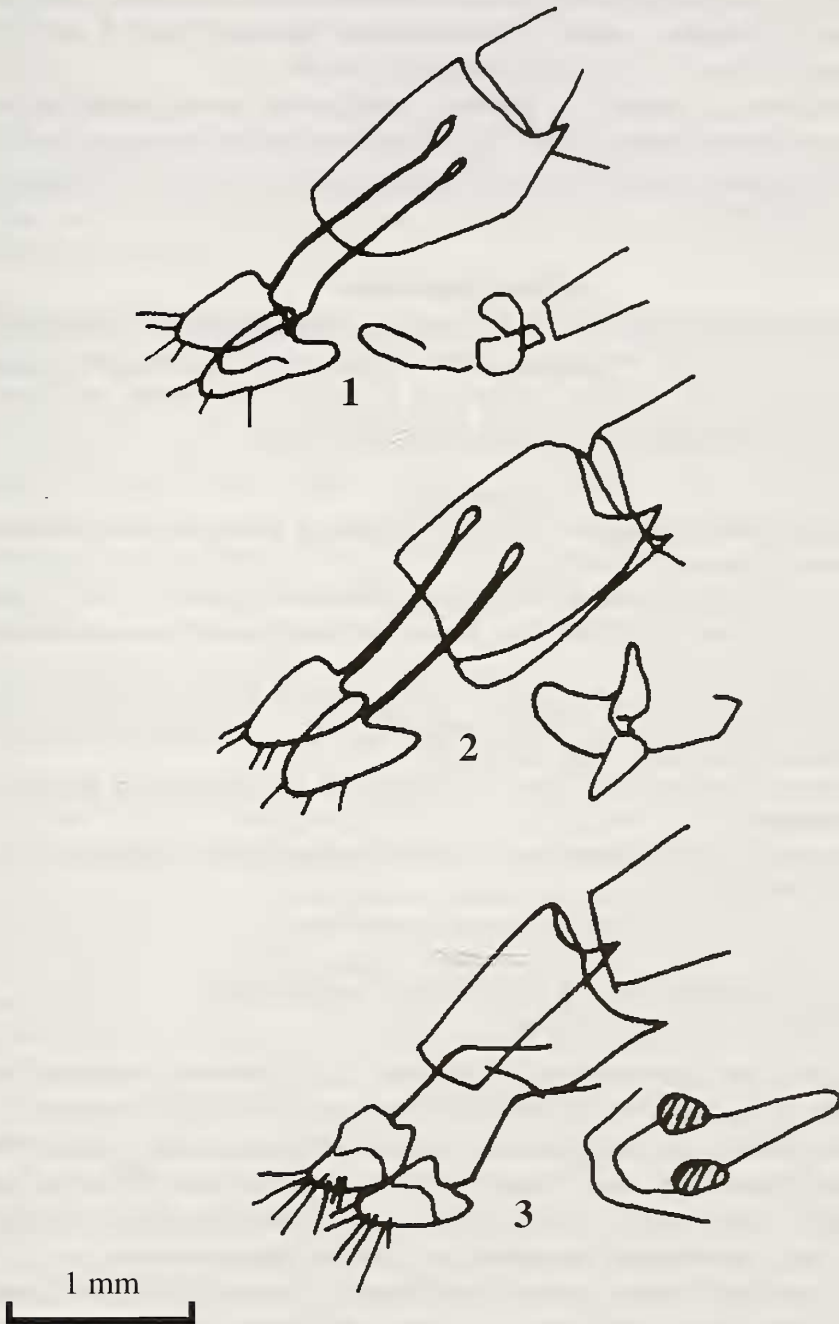


Fig. 1. Ovipositor of aberrant *Maculinea* butterfly from Prades, Eastern Pyrenees, July 1993.

Fig. 2. Ovipositor of *M. arion arion* from Prades, Eastern Pyrenees, July 1993.

Fig. 3. Ovipositor of *M. alcon* subsp? from Prades, Eastern Pyrenees, July 1993.

rods, than to the ovipositor of an *alcon* subsp? from the meadow (Fig. 3). The sides of the *alcon* subsp? ovipositor are less heart-shaped and the supporting rods have an elbow and no swelling at the ends.

The specimen is probably an aberrant female *arion*, as suggested by the structure of the ovipositor, but it is not impossible that *arion* and *alcon* which fly together and have the same chromosome number ($n = 23$; Higgins, 1975) can hybridise.

Acknowledgements

I thank the Trustees and Staff of the British Museum (Natural History) for allowing use of the Entomology Library and butterfly collections in this study, and especially Mr P.R. Ackery for his help. I also thank Mr David Wilson for photographing the species depicted in Plate H.

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Notable ant (Hymenoptera: Formicidae) records from Glen Strathfarrar, East Inverness

Glen Strathfarrar National Nature Reserve (2189 hectares) occupies the lower part of Glen Strathfarrar, East Inverness (VC 96). The heavily glaciated valley has steep slopes where relatively extensive tracts of Caledonian pine forest and birch woodlands have survived. In the valley bottom, the tree cover, in combination with free draining fluvio-glacial deposits, have created ideal conditions for a number of ant species.

Mixed nests of *Formica lemani* Bondroit and *F. sanguinea* Latreille were seen in many areas where there was sandy and stony ground adjacent to trees. Glen Strathfarrar provides the beginnings of the link between the populations of *F. sanguinea* to the north at Migdale Wood (Hughes, J., 1994, Notable records of ants (Hym.: Formicidae) in south-east Sutherland. *Ent. Rec.* **106**: 75-76), and those in Glen Affric to the south. This latest record suggests that colonies of *E. sanguinea* may be surviving in other fragments of ancient birchwoods in the Glens of East Inverness and East Ross.